BGE Electric Vehicle Off-Peak Charging Rate Proposal

Maryland EVIC Briefing

October 1, 2013

Agenda

- History
- BGE Proposal Considerations
- Proposed BGE EV Off-Peak Charging Rate
- EV Charging Scenarios
- Proposal Support for PSC EV Pilot Framework
- Evaluation and Metrics
- Outreach
- Appendix – Sampling of other utility rates

History

- Public Utilities Section 7-211 (m) requires the PSC to establish by June 30, 2013 a pilot program that includes incentives for residential, commercial and government customers to recharge vehicles in a manner that will increase the reliability of the electric distribution system and lower electricity use at times of high demand
- Incentives may include:
  - Time of day pricing of electricity,
  - Credits on distribution charges,
  - Rebates on the cost of charging systems,
  - Demand Response programs, or
  - Other incentives approved by the Commission.
- The statute requires the PSC to "make every effort to include at least two electric companies in the pilot program"

History (cont'd)

- The Working Group originally established in Case No. 9261 to consider regulatory issues related to EV charging stations expanded its scope to also include discussion of the EV pilot program structure
- In February 2012 the Working Group filed its report with recommendations on a framework for, and objective of, the pilot
  - Working Group recommended to the Commission that proponents would review their proposals with the EV Working Group prior to filing and implementation to obtain non-binding feedback
- Initial proposal was brought to the Working Group in August 2012, with subsequent follow-up discussions
- BGE proposal was filed on April 10, 2013, with a supplement filed on May 13, 2013 to reflect changes in transmission rates to be effective June 1, 2013 and the SOS rates for October 1, 2103 to May 31, 2014 resulting from the April 2013 auction
- PSC Hearing on the Pilot rates was held on June 14, 2013, PSC Order issued in August.

Dynamics Impacting EV Off-Peak Charging Proposal Design

- BGE is in the process of deploying AMI, which will continue into 2014. The EV pilot period is June 2013 through December 2014, thus proposal design must be able to work with both legacy and AMI meters
- TOU rating periods must work with both AMI and legacy meters during the initial pilot timeframe
- EV penetration remains fairly modest in BGE territory with only several hundred plug-in vehicles on which we have data
- Plug-in vehicles (PEV) are nearly all residential, BGE does not have information on any significant fleet or commercial commitments to PEV's to support developing a commercial option at this time
- While BGE supports the investigation of technologies that could facilitate EV customer participation in EV off peak charging and demand response, BGE would want to see more certainty in the Electric Vehicle Service Equipment (EVSE) sector in devices for residential charging from which to assess pilot opportunities

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Proposed BGE EV Off Peak Charging Rate

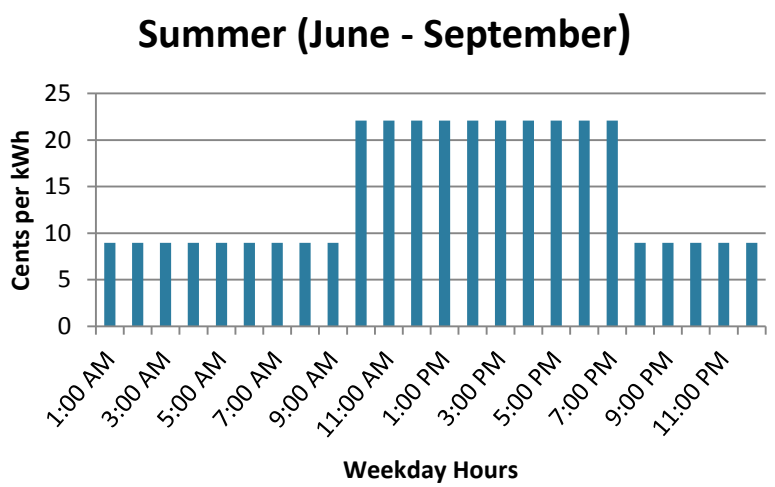
Schedule EV is a voluntary, residential TOU rate, including POLR supply, that incents a customer to charge an EV in off peak periods.

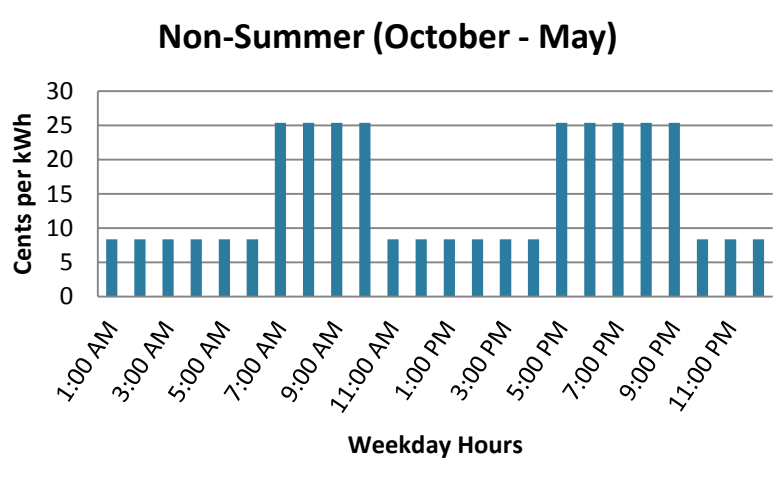
The rate schedule is applied as a "whole house" rate, it is not a separate application specifically for a customer's EV charger.

The rate design extends the off-peak rate period significantly by setting the rates for the legacy intermediate and off peak periods to one off peak rate.

Schedule EV SOS rate will change during the year with POLR auction results as do other residential rates

Proposed Schedule EV (June 2013 – May 2014)		
Customer Charge	$7.50 / month	
Summer (June – Sept 2013)	On-peak (10 am – 8 pm)	Off-peak (all other non on-peak hours)
Total SOS	19.101	5.922
Distribution	3.059	3.059
Cents per kWh	**22.16**	**8.981**
Non-summer (Oct 2013 – May 2014)	On-peak (7 am – 11 am, 5 pm to 9 pm)	Off-peak (all other non on-peak hours)
Total SOS	22.335	5.327
Distribution	3.059	3.059
Cents per kWh	**25.349**	**8.386**
Plus applicable taxes and surcharges		

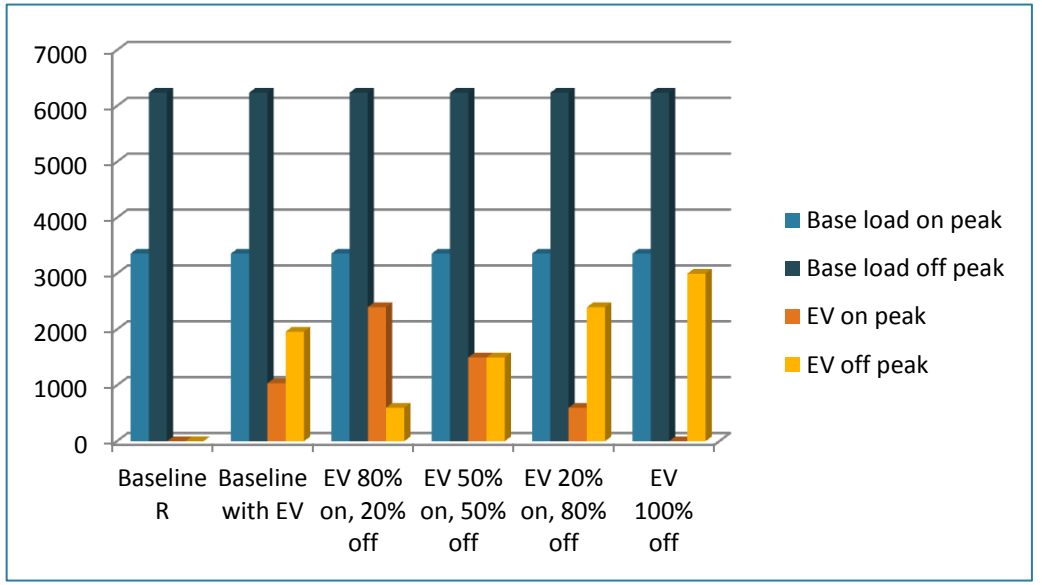




Weekends and selected holidays are all off-peak hours

EV Charging – Use Scenarios

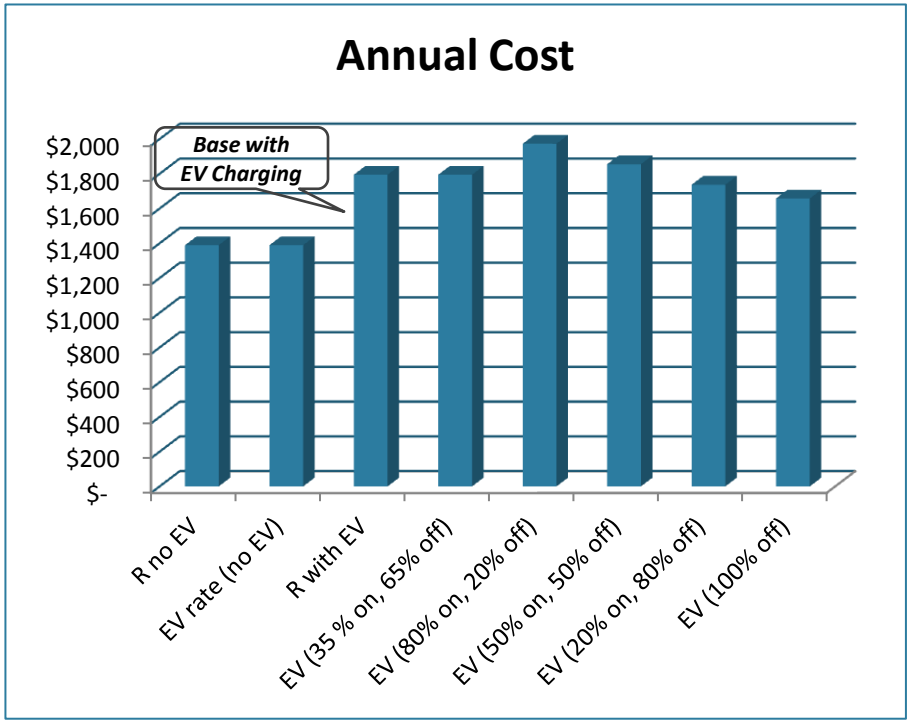
- Baseline average residential use is about 9,600 kWh per year, with 35% on peak and 65% in the intermediate and off peak periods.
- The rates for the legacy intermediate and off peak periods are combined to be one “off” peak rate for Schedule EV.
- Schedule EV rate design is revenue neutral for average household supply (SOS rate) based on a composite R & RL profile.
- Scenarios add 3,000 kWh for EV charging through the year, approximately the energy for a Chevy Volt in typical daily use.
- Baseline with EV assumes EV charging is in same proportion as other base load (~35% on peak, 65% off peak).
- Scenarios vary percent of EV charging in on and off peak periods. Base household use stays constant.

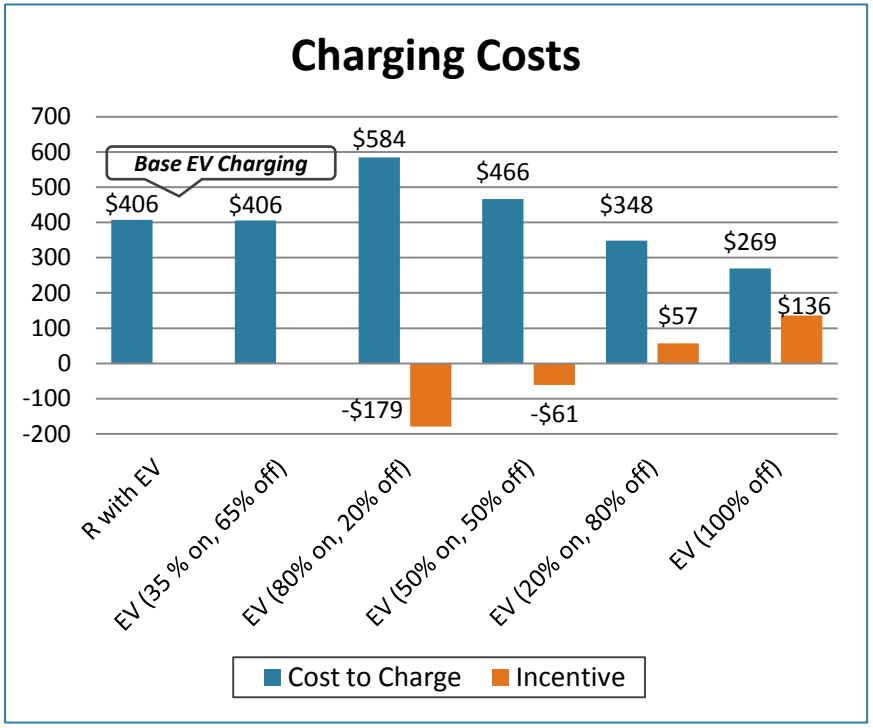


	Baseline R	Baseline with EV	EV 80% on, 20% off	EV 50% on, 50% off	EV 20% on, 80% off	EV 100% off
Base load on peak	3360	3360	3360	3360	3360	3360
Base load off peak	6240	6240	6240	6240	6240	6240
EV on peak	0	1038	2400	1500	600	0
EV off peak	0	1962	600	1500	2400	3000

Schedule EV Incentive

- Schedule EV incentive impact appears as EV charge load is added in the off peak hours
- Scenarios represent percent of charging in on and off peak periods. There is no change to the base household load total or use profile across scenarios





Baseline annual cost to charge an EV using 3000 kWh is $406 /year. Household base load remains constant across scenarios. Customers may reduce the charging costs by about $1.30 for every 10 kWh shifted from on peak to off peak with the proposed summer 2013 rates.

Additional Details

- EV Rate is voluntary, customers will be encouraged to stay for the duration of the pilot but will be allowed to leave if they request. There is no penalty for withdrawing from pilot participation
- Customers will be required to participate in two short interviews or surveys to assess their charging behaviors and any changes in behaviors at the start and at the end of the pilot period or when they exit the program
- Pilot rate information and explanation will be posted on bge.com with examples of impacts of added load and shifts to off-peak
- Customers could also shift other household loads to off peak hours while on the pilot rate
- Proposed effective date would be June 2013. Propose initial re-evaluation timeframe of December 2014 for consistency with PSC pilot period
- Customers may continue to participate in BGE's Peak Rewards and Smart Energy Rewards programs

Case No. 9261 EV Working Group - Proposed Pilot Framework

The PSC Working Group recommendation envisioned that Pricing proposals could include off-peak charging and time-of-use pricing options.

Pricing proposals could demonstrate or evaluate:

- Ability to encourage or drive consumer behavior to increase the efficiency and reliability of the electric distribution system
- Ability to lower electricity use at times of high demand or encourage charging in off-peak periods
- Ability of pricing period differentials and/or other incentives to incentivize off-peak charging behavior
- Ability of distribution credit or other strategies to incentivize off-peak charging behavior
- Customer education requirements and channel effectiveness
- The use of technology tools (in-car programming, cell phone applications, and others) to support the desired charging behavior

Specific metrics and findings for pricing proposals could include:

- Number of participants participating in the pricing offer
- Analysis of the participant EV charging energy use profile and difference from baseline expectations
- Participant satisfaction and acceptance (post-participation survey of participants)
- Degree that participant behavior is affected or changed from their norm (may be self-reported)
- Participant feedback on effectiveness of communications
- Participant feedback on perceived value of technology tools

BGE's Proposal Supports the Pilot Objectives

- Ability to encourage or drive consumer behavior to increase the efficiency and reliability of the electric distribution system:
  - The proposed EV rate encourages customers to charge their EV in off peak periods. The load shift will help reduce the potential added demand that would otherwise be imposed in periods of peak demand
- Ability to lower electricity use at times of high demand or encourage charging in off-peak periods:
  - Pricing incentive in the rate design encourages customers to charge their EVs in off-peak periods, reducing potential EV charging load in high demand periods
- Ability of pricing period differentials and/or other incentives to incentivize off-peak charging behavior:
  - Pricing design provides incentive to charge in off-peak periods. Customers may voluntarily shift other household loads to off peak for added savings. Follow-up interviews will help assess effectiveness of proposed rate

Proposed Metrics (High Level)
Subject to further discussion with PSC Staff

Metrics and Findings Details

Understanding participant and non-participant pools:

Total residential EV customers (own, lease, etc.) – source MVA data

- EV customers with retail supplier
- EV customers with net metering
- EV customers currently on TOU and utility SOS
- EV customers on standard rates and utility SOS
- EV customers participating in the pilot rate

- Track counts and distribution from pilot initiation in September 2013 to pilot assessment point, on/about December 2014
- Key Question:

  To what extent can we leverage the list of customers with EV's as identified through MVA data?

  - Load profile analysis (does not involve customer contact)
  - Non-participant behavior survey (involves customer contact – but not marketing)

Quantitative Analysis

- Capture load profile information for participants and non-participant groups, specifically
  - Initial consumption level and, where available, time interval breakout (on peak, off peak proportions)
  - Assessment point (post pilot) consumption and time interval breakout (on peak, off peak proportions)
  - Develop comparison to residential customer class as a whole
  - For participants, assess data at start of participation and at exit or end of initial assessment period
  - For non-participants, review data on/about September 2013 and again at end of initial assessment period
  - Suggest December 2014 be designated as “post” survey point

Behavioral Survey – Qualitative Information

Survey is currently structured as an on-line survey to facilitate data collection

Propose to use similar questions as for non-participants to allow comparison between participants and non-participants

Participants:

- Conduct initial and “post” surveys of participants to assess baseline conditions, awareness and behavioral perceptions
  - Initial survey at time of enrollment, “post” survey at time of exit or at end of initial assessment period

Non-participants:

- Currently identified by MVA data – will work to confirm we can contact these customers for purpose of pilot information

Survey Question Topics:

Similar questions of participants and non-participants for initial and post surveys to allow comparison of responses

- Type of vehicle
- Primary charging location
- Type of charging equipment in the home (L1 or L2)
- Secondary charging locations
- Miles driven on an average week day
- Awareness and use of programmable tools to manage EV charging
- Time of day most likely to start charging
- Time of day of highest household use
- Other ways the customer manages energy use and costs
- Additional considerations - to be determined:
  - Awareness of rate and supply options
  - Awareness of pilot rate (non-participants) - tbd
  - Level of interest in pilot rate – reasons..
  - Satisfaction with pilot (participants – post survey)
  - Suggestions for tools or offerings they would find beneficial (tbd)

Outreach and Communication

- Primary outreach will be through BGE.com and EV stakeholder network
  - Rate explanation and Frequently Asked Questions on BGE.com
    - Leverage Banner Alert message to call attention to rate as needed
  - Consider article in BGE Connections
  - Printed information to support group meetings, EXPOs and community energy events
  - Plugin@BGE.com mailbox inquiries and interest
- Leverage EV Stakeholder network
  - BEVI
  - EV groups
  - MEA events, outreach
  - MD EVIC connections
  - EV Dealer information and outreach

Appendix

Other Utility EV Rates

Comparisons to Other Utility EV Rates

Georgia Power Whole House -Schedule TOU-PEV-3 Effective 1/2013	DTE Energy (MI) EV Only -Schedule NO. D1.9: Effective 10/29/2011
(Total Rate) *On-peak* @ 20.3217¢ per kWh ➢ 2pm – 7pm June – Sep, Mon - Fri *Off-peak* @ 6.1132¢ per kWh ➢ 7am – 2pm, 7pm – 11pm June – Sep, Mon – Fri ➢ 7am – 11pm Weekends, Oct - May *Super Off-peak* @ 1.3063¢ per kWh ➢ 11pm – 7am All months, Mon - Sun	(Generation only) *On-peak* @ 14.0¢ per kWh ➢ 9am – 11pm Mon - Fri *Off-peak* @ 3.5¢ per kWh ➢ 11pm – 9am Mon - Fri ➢ All day Sat and Sun

Comparisons to Other Utility EV Rates

Dominion Power (VA) Whole House Option: Schedule 1EV Effective: 12/01/2012	Dominion Power (VA) EV Only Option: Schedule EV Effective: 12/01/2012
(Generation rates only) <u>Billing Months of April 16 – October 15</u> *On-peak* @ 9.501¢ per kWh ➢ 1pm – 7pm *Intermediate-peak* @ 3.818¢ per kWh ➢ 10am – 1pm, 7pm – 10pm *Off-peak* @ 1.652¢ per kWh ➢ 10pm – 1am, 5am – 10am *Super Off-peak* @ 0.444¢ per kWh ➢ 1am – 5am <u>Billing Months of October 16 – April 15</u> *On-peak* @ 4.605¢ per kWh ➢ 6am – 11am, 5pm – 10pm *Off-peak* @ 2.106¢ per kWh ➢ 5am – 6am, 11am – 5pm, 10pm – 1am *Super Off-peak* @ 1.388¢ per kWh ➢ 1am – 5am	(Generation rates only) *On-peak* @ 10.769¢ per kWh ➢ 6am – 10pm *Off-peak* @ 1.429¢ per kWh ➢ 5am – 6am, 10pm – 1am *Super Off-peak* @ 0.684¢ per kWh ➢ 1am – 5am *Requires the installation of an additional meter specifically for EV

Comparisons to Other Utility EV Rates

Southern California Edison (CA)

Whole House - Schedule: TOU-D-TEV

Effective: 4/01/2013

Level 1 (Up to 130% of Baseline)

¢/kWh/Meter/Day	Delivery charge	Generation charge	Total price
Summer			
On-peak	4.7¢	23.41¢	**28.11¢**
Off-peak	4.7¢	7.7¢	**12.4¢**
Super-off-peak	7.1¢	2.3¢	**9.4¢**
Winter			
On-peak	4.7¢	11.4¢	**16.1¢**
Off-peak	4.7¢	6.0¢	**10.7¢**
Super-off-peak	7.1¢	3.09¢	**10.2¢**

Level 2 (More than 130% of Baseline)

$/kWh/Meter/Day	Delivery charge	Generation charge	Total price
Summer			
On-peak	23.7¢	23.4¢	**47¢**
Off-peak	23.7¢	7.7¢	**31.0¢**
Super-off-peak	7.1¢	2.3¢	**9.4¢**
Winter			
On-peak	23.7¢	11.4¢	**35.1¢**
Off-peak	23.6¢	6.0¢	**30.0¢**
Super-off-peak	7.1¢	3.1¢	**10.2¢**

Southern California Edison (CA)

EV Only - Schedule: TOU-EV-1

Effective: 4/01/2013

A separate meter is required

¢/kWh/Meter/Day	Delivery charge	Generation charge	Total price
Summer			
On-peak	14.9¢	18.31¢	**33.3¢**
Off-peak	7.06¢	3.6¢	**10.7¢**
Winter			
On-peak	14.9¢	7.9¢	**22.9¢**
Off-peak	7.1¢	4.0¢	**11.1¢**

(EV Only) Summer and Winter

On Peak: 12pm – 9pm All year, Every day
Off Peak: 9pm – 12pm All year, Every day

(Whole House) Summer and Winter

On Peak: 10am – 6pm Weekdays all year, Except Holidays
Off Peak: 6am – 10am, 6pm – 12am all year, everyday
Super Off Peak: 12am – 6am all year, everyday

Summer: May 1st – Nov 1st @ 12 a.m.
Winter: Nov 1st – May 1st @ 12 a.m.